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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/046,629

01/14/2002

Yuzuru Suzuki

SUM-02301

4803

26339

7590

01/29/2004

PATENT GROUP

CHOATE, HALL & STEWART

EXCHANGE PLACE, 53 STATE STREET

BOSTON, MA 02109

EXAMINER

COMAS, YAHVEH

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/046,629

Applicant(s)

SUZUKI ET AL.

Examiner

Yahveh Comas

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments see pages 5-10, filed 2/25/2003, with respect to claim 1 have been fully considered and are persuasive. The rejection of claim 1 has been withdrawn.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claim 1, 2, 4, 8-11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. JP 11146616 A in view of Uchida et al. U.S. Patent No. 5,355,044.

Suzuki disclose a inner rotor type brushless DC motor comprising a rotor unit which is rotatably arranged within the motor and has a cylindrical field magnet (13) to holder (14) means into which a rotating shaft (15) is press fitted at a center thereof, said cylindrical field magnet

Art Unit: 2834

(13) being magnetized such that S and N poles alternate with each other in a circumferential direction thereof, and a stator unit (20) which is circumferentially arranged around said rotor is comprised of a plurality of stator yokes being formed by circumferentially staking a large number of thin plates each of which constitutes a salient pole (23), and a plurality of coil units (12), each being formed by winding a magnet wire on a bobbin (19) and mounted on each of said stator yokes but doesn't disclose each of the S and N poles has a plurality of stages formed in an axial direction and shifted from each other in the circumferential direction of said field magnet with predetermined shift amount.

However, Uchida disclose a revolving magnetic field type motor comprising a rotor (10) with block wherein each block has a plurality of magnets (M). One set of the permanent magnets is offset relative to an adjacent set of permanent magnets for decreasing the cogging torque. The magnets are shifted from one to another around the axis of the rotor by an angle corresponding to a half of the wavelength of a first cyclic torque ripples

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Suzuki's invention and provide each of the S and N poles has a plurality of stages formed in an axial direction and shifted from each other in the circumferential direction of said field magnet with predetermined shift amount as disclose by Uchida since this would have been desirable to decrease the cogging torque.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to shift the respective stages within a range of 12° to 50°, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233

Art Unit: 2834

5. Claim 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. JP 11146616 A in view of Uchida et al. U.S. Patent No. 5,355,044, and in further view of Hoemann et al. U.S. Patent No. 5,034,642.

Suzuki as modify above, disclose the claimed invention except for the rotor position detection element is adjusted by  $\frac{1}{2}$  the shift amount of respective stages.

However, Hoemann disclose a rotor position detection element (17) is adjusted by  $\frac{1}{2}$  the shift amount of respective stages (25, 27 and figures 3-7) for the purpose of maintaining an optimum sensor position relative to the rotor field without requiring physical adjustment of the sensor.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Suzuki's invention and provide a rotor position detection element adjusted by  $\frac{1}{2}$  the shift amount of respective stages as disclose by Hoemann since this would have been desirable to maintaining an optimum sensor position relative to the rotor field without requiring physical adjustment of the sensor.

6. Claim 5, 7, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. JP 11146616 A in view of Uchida et al. U.S. Patent No. 5,355,044, and in further view of Carrier et al. U.S. Patent No. 5,717,268.

Suzuki, as modify above, disclose the claimed invention except for the DC motor is an outer rotor type brushless three phases DC motor having eight poles and six stator units.

However, Carrier disclose a DC brushless motor with a eight poles outer rotor (10) and a six poles stator unit, wherein the number of field magnets in arrangement (28) relative to the

Art Unit: 2834

number of poles in the stator are chosen to achieve an acceptable balance between torque ripple and switching losses.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Suzuki's invention and provide outer rotor type brushless three phases DC motor having eight poles and six stator units as disclose by Carrier since this would have been desirable to achieve an acceptable balance between torque ripple and switching losses.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. JP 11146616 A in view of Uchida et al. U.S. Patent No. 5,355,044, and in further view of Burgbacher et al. U.S. Patent No. 4,998,032.

Suzuki, as modify above, disclose the claimed invention except for the DC motor has an inner rotor with eight poles and six stator unit.

However, Burgbacher discloses a DC brushless motor with an eight poles inner rotor (200) and a six poles stator unit (311-316) since in a rotor (200) with a larger number of poles (201), the cog height, which narrow the air gap and act like "magnetic cogs" exerting forces on the rotor that are utilized to even out the torque, can be reduce to 1/3 the height.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify Suzuki's invention and provide outer rotor type brushless three-phases DC motor having eight poles and six stator units as disclose by Burgbacher since this would have been desirable to reduce 1/3 of the cogs height which narrow the air gap and act like "magnetic cogs" exerting forces on the rotor that are utilized to even out the torque.

Art Unit: 2834

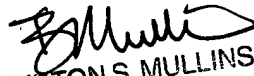
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yahveh Comas whose telephone number is (703) 305-3419. The examiner can normally be reached on M - F 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

YC

  
BURTON S. MULLINS  
PRIMARY EXAMINER